SeaEra Toilet

OPERATION, MAINTENANCE AND INSTALLATION INSTRUCTIONS

THE FOLLOWING ARE CAUTIONARY STATEMENTS THAT MUST BE READ AND FOLLOWED DURING BOTH INSTALLATION AND OPERATION.

WARNING: *Raritan Engineering Company, Inc. recommends that a qualified person or electrician install this product. Equipment damage, injury to personnel or death could result from improper installation. Raritan Engineering Company, Inc. accepts no responsibility or liability for damage to equipment, injury or death to personnel that may result from improper installation or operation of this product.*

WARNING: **HAZARD OF SHOCK OR FIRE**

Always use recommended fuse, circuit breaker and wire size.

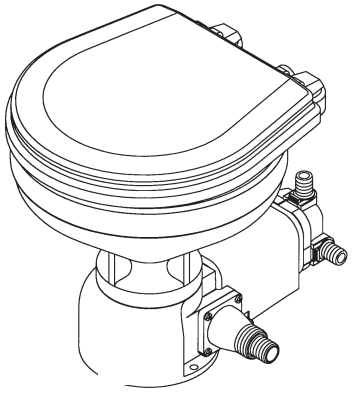
Motors used with this product are "Ignition Protected". They are not however, explosion-proof as defined in 46CFR 110.15-65(e), Subchapter J-Electrical Engineering.

DO NOT run continuously for more than 30 seconds.

WARNING: **HAZARD OF FLOODING** - Always shut off seacock(s) before leaving the boat unattended.

Double clamp all below waterline hose fittings and check frequently for integrity.

Sea Water Model (Integral Pump)



The SeaEra toilet is a powerful centrifugal macerating toilet that thoroughly breaks down waste.

Serial # and specs:

RARITAN
The Most Dependable Name on the Water

1-800-352-5630
www.raritaneng. com

MAINTENANCE

IMPORTANT SAFETY INSTRUCTIONS:

WARNING: HAZARD OF FLOODING - Always shut off seacock(s) before leaving the boat unattended. Double clamp all below waterline hose fittings and check frequently for integrity.

Toilets mounted at or below the waterline must have a vented loop installed in the discharge line. The top of the vented loop must be a minimum of 4" (10cm) above the waterline at the boats greatest angle of heel (see vented loop manufacturer's instructions).

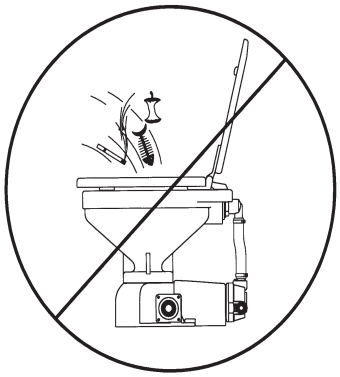
Sea Water Models must also have a vented loop installed between the intake pump and the toilet bowl.

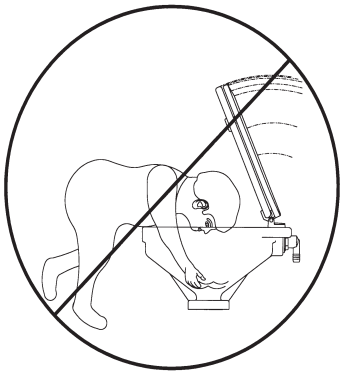
Double clamp all below waterline connections.

WARNING:

Young children should NOT be left unsupervised around toilet. Serious injury or death could occur. Children can drown in water retained in the bowl. Seat and/or lid could close and strike child.

Always replace circuit breaker and fuses with same rating . Use Raritan parts to maintain ignition protection requirements.





- No special toilet paper is required.
- Water should appear in the bowl within ten seconds. If not, see troubleshooting section.
- Hard objects or stringy substances (paper towels, feminine hygiene products, filter cigarettes, etc.) must not be thrown into the toilet as they will cause damage.
- Always shut off seacock(s) before leaving the boat unattended.

Cleaning Instructions

IMPORTANT: Do not use cleaners that contain ammonia, ethyl acetate, phosphoric acid or concentrated chlorine bleach. These may cause damage to the toilet.

Using Raritan C.P. (part# 1PCP22) a bio-enzymatic toilet bowl cleaner will keep the bowl clean and fresh smelling.

Recommend Visual Inspection

- ✔ For leaks at toilet and hose connections
- ✔ Hose clamps
- ✔ Condition of hoses
- ✔ Seacocks
- ✔ Condition of wires and connections
- ✔ In-Line Strainer (if you have one)

Cleaning In-Line Strainer

Optional Part# 163000

Shut off intake seacock. Unscrew bowl. Remove filter. Clean bowl and filter with a clean cloth. Clean gasket and gasket contact surfaces thoroughly. Replace gasket, filter and bowl. Open seacock. Check for leaks.

IMPORTANT

- **Improper winter lay up is a major cause of marine toilet failure.**
- **Use only nontoxic antifreeze.**
- **Flush toilet several times to clear waste from system.**
- **Dispose of all antifreeze in accordance with local and federal regulations.**
- **Winterize holding tanks, plumbing, treatment systems (MSD's), etc. independently following manufacturer's instructions.**

Integral Pump Models

Parts Required

3/4" (19mm) I.D. intake hose approximately 3 feet (1m) long.

1" (25mm) or 1 1/2" (38mm) I.D. discharge hose approximately 3 feet (1m) long.

Two buckets

Nontoxic antifreeze approximately 1 quart (1 liter)

Steps

1. Close the intake and discharge seacocks.
2. Turn off power to unit.
3. Disconnect and drain intake hose, discharge hose and In-Line Strainer.
4. Connect short hoses to toilet's intake and discharge.
5. Place one bucket under hose connected to toilet's discharge.
6. Pour nontoxic antifreeze in other bucket.
7. Place hose connected to intake pump into bucket with antifreeze.
8. Turn on power to unit and flush toilet until antifreeze begins to be discharged from toilet.
9. Disconnect power to toilet.

RECOMMISSIONING

1. Using the buckets, hoses and approximately one gallon (3.8 liters) of clean fresh water, flush antifreeze out of the toilet (see Winterizing). Dispose of antifreeze in accordance with local and federal regulations.
2. Reconnect the intake and discharge hoses and open both seacocks and water source valve.
3. Check all connections for leaks with several test flushes.

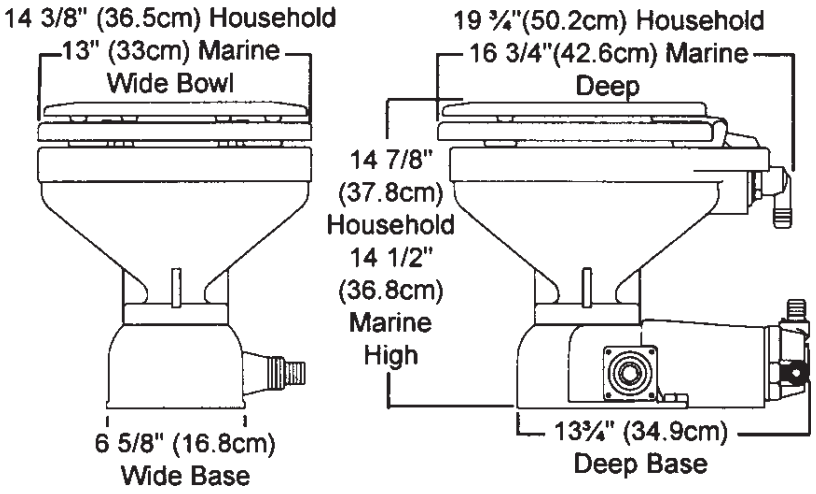
SYSTEM START-UP

1. Open seacock(s).
2. Turn on power to toilet.
3. Flush toilet per Operation Instructions.
4. Check for leaks.

IMPORTANT: If toilet does not flush properly or if water does not enter the bowl within 10 seconds, refer to Troubleshooting.

SPECIFICATIONS

Sea Water Model (Integral)



Plumbing

Maximum suction of Intake pump (Maximum height above waterline)	4 Ft. (1.2m) from Intake Pump.
Maximum height of discharge vented loop	6 Ft. (1.8m) from base of toilet.
Pressurized water source requirements	minimum flow rate of 3 gpm (11.3 liters). minimum pressure of 5 psi (34.5 kPa).

CONVERSIONS

Wire - AWG to mm²

AWG	16	14	12	10	8	6	4	2
mm²	1.5	2.5	4.0	6.0	10.0	16.0	25.0	35.0

Feet to Meters

Feet	10	15	20	25	30	40	50
Meter	3.1	4.6	6.1	7.6	9.2	12.2	15.2

NOTES: for Wiring

1.	Distances are from source to unit and back to source.
2.	Distance from power source to remote intake pump MUST be included when determining total distance.Same wire size MUST be used for lower base and remote intake pump.
3.	Recommended conductor wire minimum AWG (mm²) for 3% voltage drop.
4.	Recommended conductor sizes are based on 105°C rated insulation. Refer to ABYC Standards for other insulation ratings.
5.	For 120/240 VAC units, use 12VDC specifications from transformer to unit.

Sea Water Model - Recommended Wire and Fuse/Circuit Breaker Size

Units Voltage	Circuit Breaker/fuse size (amps)	Integral Pump and lower base Amp. draw @ nominal voltage	15 feet	20 feet	30 feet	40 feet	50 feet
12 VDC	**25**	**18**	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG
24 VDC	**15**	**10**	14 AWG	14 AWG	12 AWG	10 AWG	10 AWG
32 VDC	**15**	**7.5**	14 AWG	14 AWG	14 AWG	12 AWG	12 AWG

Parts Included

All Complete Toilets

Toilet bowl , seat and cover
Lower base assembly, motor cover
Push Button Switch

Sea Water Model

3/4" Hose barb - straight fitting (2)
3/4" Hose barb - 90° fitting
Plug fitting

Tools Required

5/16" nut driver, wrench or screw driver , 5/8" (16mm) drill bit, bit for drilling mounting surface, wire cutters, wire terminal crimpers, hose cutters, tape measure

Mounting Toilet

Mounting surface must be flat and solid.

1. Install seat on toilet.
2. Remove motor cover.
3. Place toilet where it will be located.
   Make sure there is room to route hoses.
   Make sure seat will open properly.
4. Mark location of toilet base mounting holes on mounting surface.
5. Drill holes for toilet mounting bolts/screws.

NOTE: Hole size will depend on type of bolt/screws used (5/16" [8mm] size bolts/screws are recommended).

6. Secure toilet to surface.

90° Rotation of Toilet Bowl

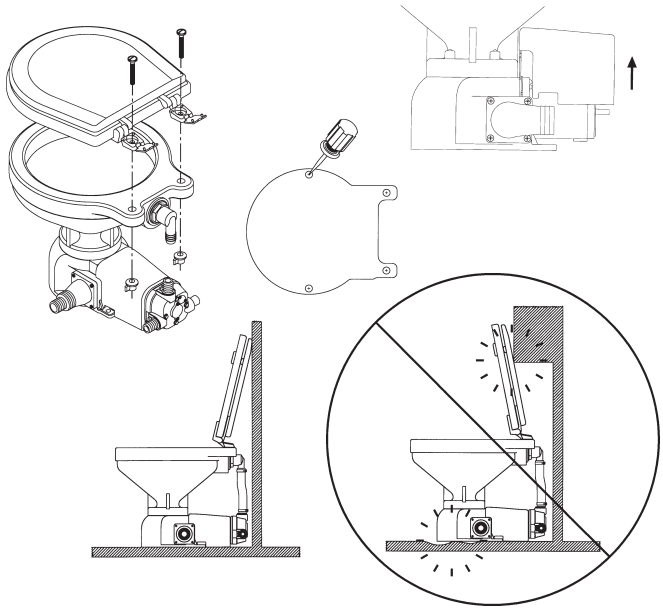
Toilet bowl can be rotated 90° on the base, for installing in confined locations.

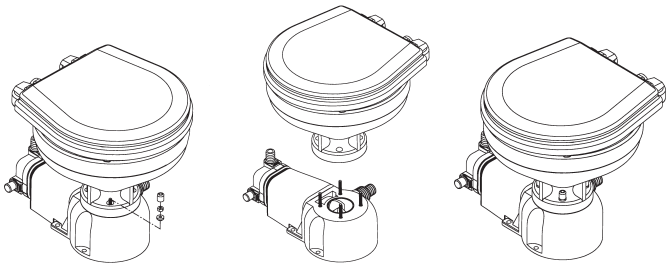
1. Determine which direction bowl is to be mounted.
2. Remove hose at back of toilet.
3. Remove four vinyl caps at the base of toilet bowl.
4. Remove four nuts and shoulder washers.
5. Carefully remove toilet bowl from base.
6. Rotate toilet bowl to desired position.
7. Replace four shoulder washers, nuts and vinyl caps.

NOTE: Tighten nuts carefully and evenly. Do Not over tighten.

Additional Parts Required

- Four stainless steel mounting bolts or lag screws (minimum 1/4" [6mm]) and washers
- 1" (25mm) or 1 1/2" (38mm) I.D. discharge hose
- 3/4" (19mm) I.D. reinforced intake hose
- 3/4" (19mm) and 1" (25mm) or 1 1/2" (38mm) hose clamps (two for each connection below waterline)
- Wire
- Terminals
- Fuse/circuit breaker





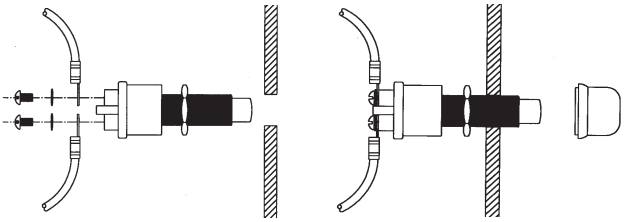
NOTE: Replace existing hose from the intake pump to the toilet bowl with a longer hose.

INSTALLATION

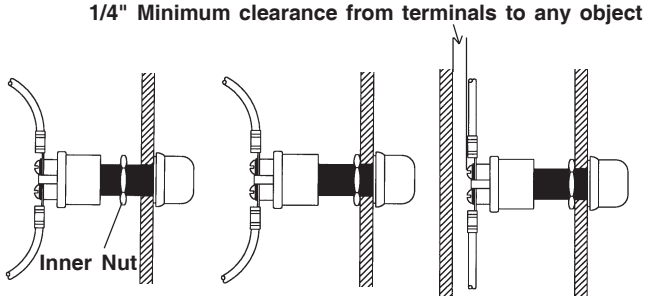
Mounting Push Button Switch

- Mount Push Button Switch in an accessible location.
- Make certain wires can be routed to Push Button Switch.
- Wire terminals must have clearance when installed.

1. Drill 5/8" (16mm) hole.
2. Attach wires to Push Button Switch terminals (see wiring section).
3. Install Push Button Switch through back of mounting surface.
4. Install waterproof nut on Push Button Switch.
5. Secure in place with inner nut.



1/4" Minimum clearance from terminals to any object



Install the Warning Label (L322) where it can be easily seen

Mounting In-Line Strainer (OPTIONAL - Seawater Models Only)

Make sure strainer bowl is tight.

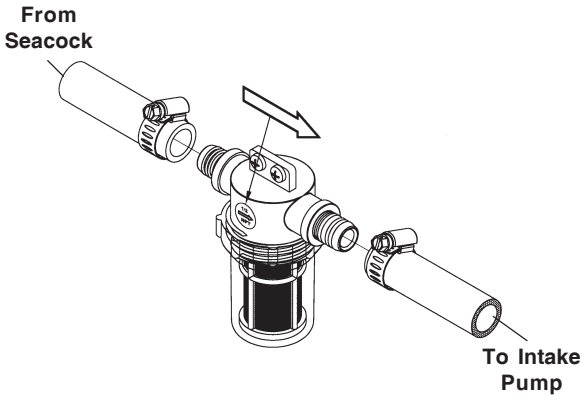
1. Locate strainer where it will be accessible.
2. Mark and drill mounting holes.

NOTE: Hole size will depend on type of bolts/screws used (1/4" [6mm] size bolts/screws are recommended).

3. Install fittings provided (PLA14) on strainer's inlet and outlet ports.

NOTE: Use thread sealant.

4. Mount strainer. Hoses must be installed according to flow marking on strainer top.



PLUMBING

WARNING: Hazard of Flooding

Toilets mounted at or below the waterline must have a vented loop installed in the discharge line. The top of the vented loop must be a minimum of 4" (10cm) above the waterline at the boats greatest angle of heel (see vented loop manufacturer's instructions).

Sea Water Models must also have a vented loop installed between the intake pump and the toilet bowl.

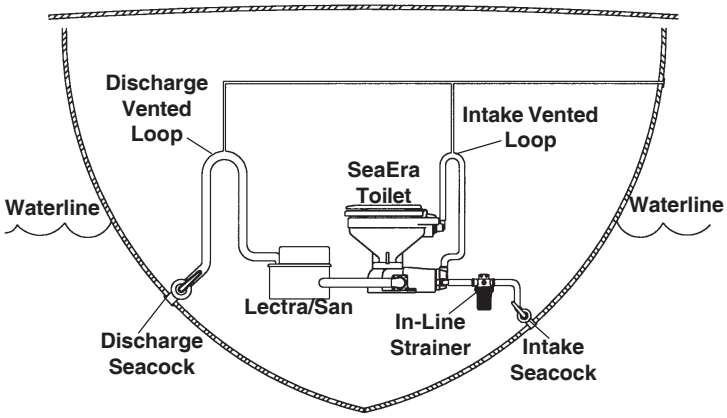
Double clamp all below waterline connections.

PLUMBING (cont'd)

IMPORTANT

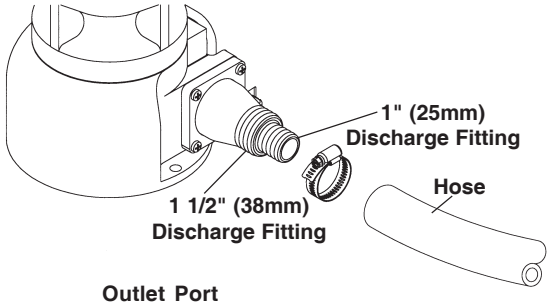
- **Fittings and 90° bends should be kept to a minimum.**
- **Discharging untreated sewage is forbidden in all U. S. waters within the three-mile limit.**
- **Thru-hull fittings and seacocks must be installed where they are easily accessible.**
- **Use only quality reinforced hoses.**
- **Secure all hoses properly.**

Sea Water Model with Integral Pump Installed Below Waterline



Discharge Lines

1. Connect quality sanitation hose 1" (25mm) or 1 1/2" (38mm) I.D. to discharge fitting on toilet. Available from Raritan: Saniflex Hose part number SFH for 1 1/2" or SFH1 for 1".
2. Run hose to appropriate device (i.e.: treatment system, holding tank, etc.).



Intake Lines

Intake pump fittings are interchangeable to allow more flexibility during installation. Inlet ports are located on either side of intake pump. Outlet port (to toilet bowl) is at top of intake pump.

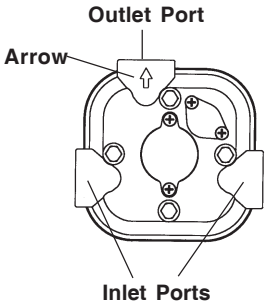
1. Slide fitting clips to open position.
2. Select inlet port to be used.
3. Install appropriate fittings into inlet and outlet ports.

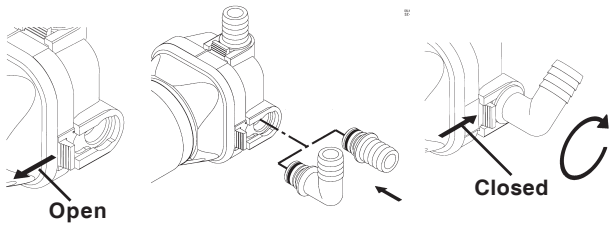
NOTE: The 90° fitting can be rotated 360°.

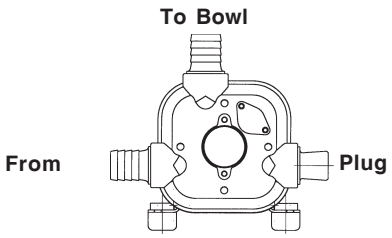
4. Install the plug fitting into unused inlet port.

IMPORTANT: Be sure not to install plug fitting into outlet port! Damage will occur!

5. Slide fitting clips back to closed position.
6. Connect hose from seacock to inlet port of In-Line Strainer (If used). Use hose clamp provided.
7. Connect hose from outlet port of In-Line Strainer to inlet port of intake pump. Use hose clamp provided.







WIRING

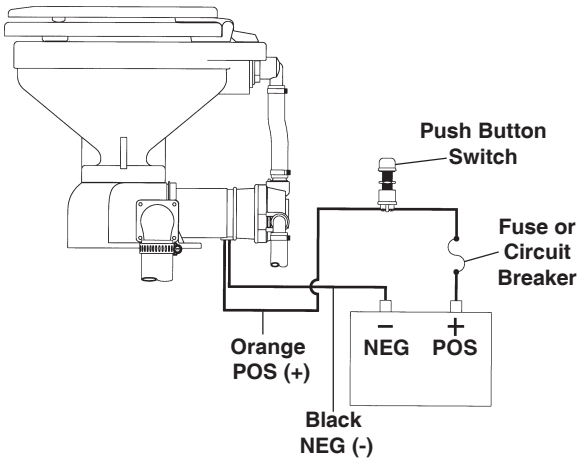
WIRING

WARNING: Hazard of Shock and Fire

- **Always use proper wire, wire connectors and fuse/circuit breaker. See Specification Chart.**
- **Secure wire properly.**
- **Do not connect appliances to toilet circuit.**
- **Make sure power is off before proceeding.**
- **Use proper wire terminals for all wire connections.**

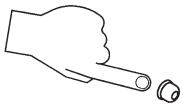
1. Determine proper wire size by measuring distance from:
   - Power Source to push-button to toilet motor and back to power source.
2. Select proper wire and fuse/circuit breaker size from Specifications on Installation page.
3. Install fuse/circuit breaker in positive line at source.
4. Connect positive wire from fuse/circuit breaker to Push Button Switch.
5. Connect wire from Push Button Switch to orange wire on motor(s).
6. Connect wire from battery negative or power source ground buss to black wire (negative) on motor(s).

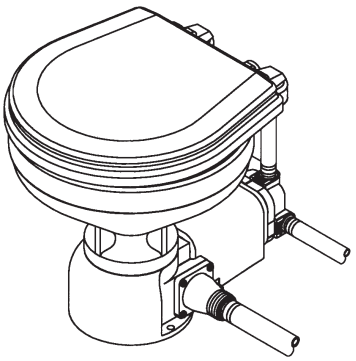
Integral Pump Wiring



OPERATION

Press push-button switch and hold until all waste is cleared from the toilet bowl.





TROUBLESHOOTING

WARNING: HAZARD OF ELECTRIC SHOCK - Before beginning any work on the SeaEra, be sure that all power to the unit has been turned off.

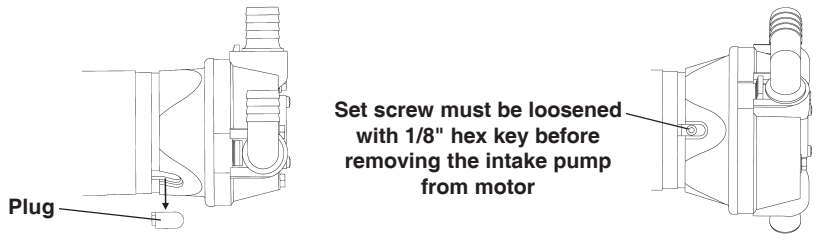
WARNING: HAZARD OF FLOODING - Make sure seacocks are in the CLOSED or OFF position before working on toilet.

NOTE: The following information reflects the most probable causes and solutions to problems although not every possible cause and solution is provided.

Any questions regarding servicing or operation of the SeaEra should be directed to our Technical Support Department in Millville, NJ or Ft. Lauderdale, FL. Please have model and serial number available before calling.

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Poor pumpout, especially solids.	1A. Clogged discharge line.	1A. Be sure discharge seacock is open. Clear line, remove clog.
	1B. Plumbing restrictions, bends and ells.	1B. Replumb to eliminate bends and ells.
	1C. Clogged vents.	1C. Clean holding tank vent and vented loop vents
	1D. Mineral buildup in hoses and fittings.	1D. Clean or replace affected parts. Replace hose if needed.
	1E. Low voltage.	1E. Check voltage at toilet **while toilet is running**. If less than nominal voltage of toilet (12, 24, or 32), check condition of batteries and wire sizes. Check terminals and wire connections for corrosion (heat at terminals and junctions indicates a bad or corroded connection).
2. Poor water flow, especially at front of bowl (or no water flow).	2A. Toilet not level.	2A. Raise rear of toilet; check with level.
	2B. Restriction in intake line.	2B. Be sure seacock is open. Clear line-remove clog.
	2C. Pump sucking air.	2C. Check all connections from intake thru-hull to intake pump to be sure no air leaks are present.
	2D. Low voltage.	2D. See 1E, above.
	2E. Clogged strainer.	2E. Remove or Clear debris from strainer.
3. Foul odors from toilet area.	3A. "Marine life" lodged in rim of bowl.	3A. Remove and flush bowl with pressure hose to remove all material. Install strainer in intake line to avoid re-currence.
	3B. Permeated discharge hose.	3B. Replace hose with Raritan sanitation hose (#SH).
	3C. Sewage remaining in discharge line.	3C. Flush toilet longer; replace hose if permeated; reroute hose making a shorter run if possible.
4. Bowl fills while underway.	4A. Pressure buildup at seacocks.	4A. Close intake, then discharge seacock to determine which is causing problem. If discharge, be sure the vent or vented loop is clean. If intake, there is too much pressure on seacock; contact Raritan Technical Support.
5. Water leaking from under unit.	5A. Leaking bowl gasket.	5A. Tighten (4) bowl mounting nuts (#1226B).
	5B. Leak at shaft seal.	5B. Check seal and motor shaft.
	5C. Leak from seal plate area.	5C. Check seal plate o-ring.
6. Erratic operation/sluggish running.	6A. Worn motor brushes.	6A. Return motor to factory for servicing or replacement.
	6B. Motor bearings damaged by seal leak.	6B. Return motor to factory for servicing or replacement.
	6C. Low or inconsistent voltage.	6C. See 1E above.

Tip for Removing Intake Pump



EXPLODED PARTS

SeaEra PARTS LIST

Part No.	Description
1108A	Macerator Nut
1222AW	90° Discharge Fitting
1226	Mounting Screw (4)
1226B	1/4-20 Hex Nut (4)
1234	Bowl Gasket
1236AW	Bowl Spud Assembly
1236E	Bowl Elbow
1237	Marine-size Bowl
1244	Household-style Bowl
1610*	Motor
161105	Base
161107	Seal Plate O-Ring
161110	Seal Plate
161115	Impeller
161120	Impeller/Macerator Housing
161123	Macerator Blade
161125	Discharge Mounting Flange
161130	Discharge Fitting
162135	Cone Seal
162225	O-Ring
162305	Lower Housing includes #162315
162310	Diaphragm includes #162315
162315	Piston (4)
162320	Piston Seat (4) includes #162315
162325A	Bearing Plate Assembly includes #162315
162405	3/4" Hose Barb - 90° Fitting
162410	3/4" Hose Barb - Straight Fitting (2)
162415	Plug Fitting
162420	Fitting Clip (3)
162425	Fitting O-Ring (4)
161140	Motor Cover

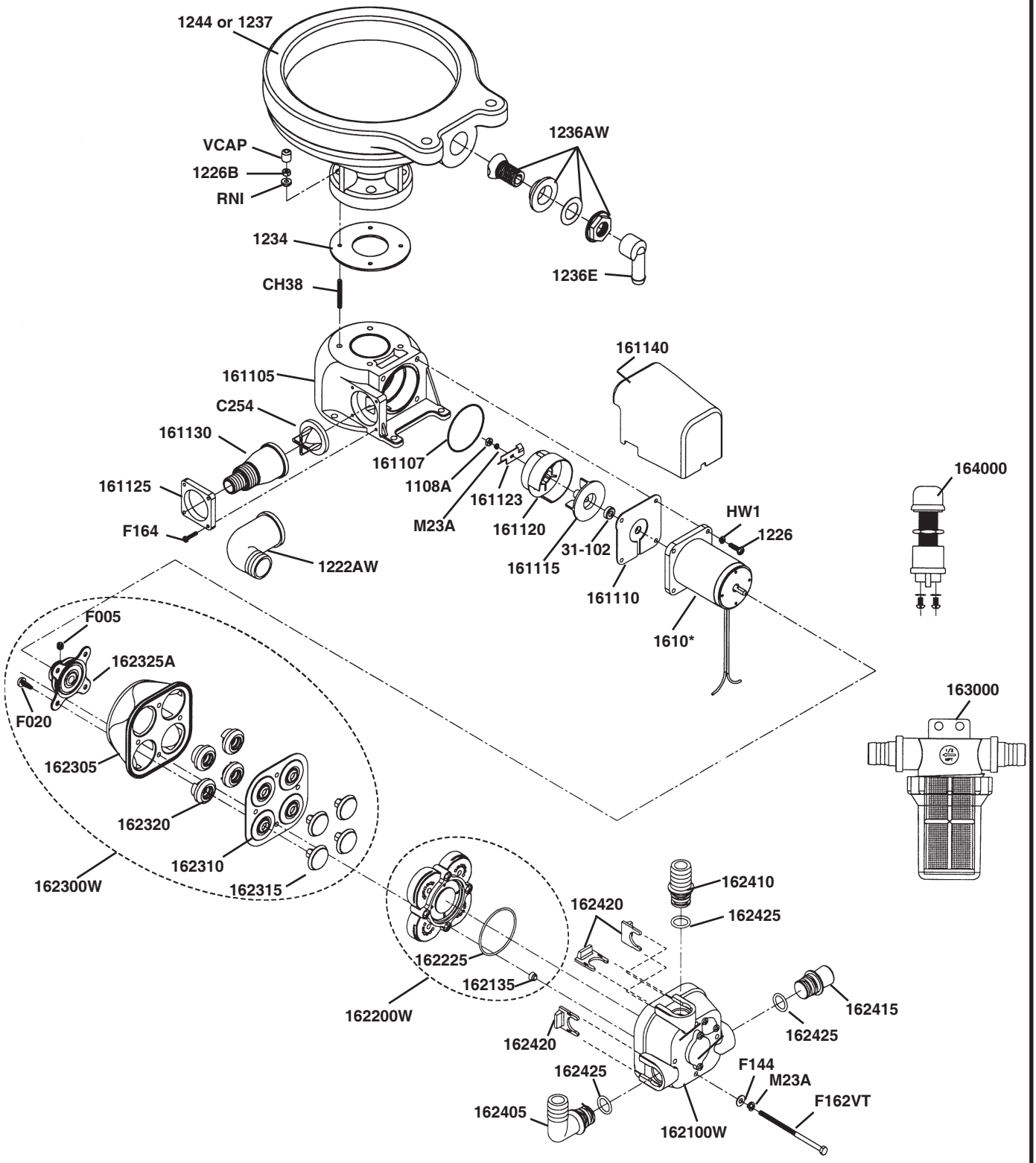
Part No.	Description
162100W	Upper Housing Assembly
162200W	Middle Housing Assembly
162300W	Lower Housing Assembly
163000	Inline Strainer
164000	Push Button Switch
31-102	Shaft Seal
41-260	Bowl Elbow (Freshwater Models Only)
C254	Joker Valve
CH38	1/4-20 Threaded Stud (4)
F005	Set Screw
F020	Piston Fastener (4)
F144	Mounting Bolt Washer (4)
F162VT	Mounting Bolt
F164	Discharge Mounting Flange Fastener(4)
HW1	Mounting Screw Lockwasher (4)
M23A	Macerator Lockwasher (5)

Repair Kits

DIAPUMPRK	Diaphragm Pump Repair Kit
SEADISRK	SeaEra Discharge Repair Kit

* Specify DC Voltage (12, 24, 32)

SeaEra Exploded Parts View



LIMITED WARRANTY

Raritan Engineering Company warrants to the original purchaser that this product is free of defects in materials or workmanship for a period of one year from the product's date of purchase. Should this product prove defective by reason of improper workmanship and/or materials within the warranty period, Raritan shall, at its sole option, repair or replace the product.

1. TO OBTAIN WARRANTY SERVICE, Consumer must deliver the product prepaid, together with a detailed description of the problem, to Raritan at 530 Orange St., Millville, N.J. 08332, or 3101 SW 2nd Ave. Ft. Lauderdale, FL 33315. When requesting warranty service, purchaser must present a sales slip or other document which establishes proof of purchase. THE RETURN OF THE OWNER REGISTRATION CARD IS NOT A CONDITION PRECEDENT OF WARRANTY COVERAGE. However, please complete and return the owner Registration Card so that Raritan can contact you should a question of safety arise which could affect you.
2. THIS WARRANTY DOES NOT COVER defects caused by modifications, alterations, repairs or service of this product by anyone other than Raritan; defects in materials or workmanship supplied by others in the process of installation of this product; defects caused by installation of this product other than in accordance with the manufacturer's recommended installation instructions or standard industry procedures; physical abuse to, or misuse of, this product. This warranty also does not cover damages to equipment caused by fire, flood, external water, excessive corrosion or Act of God.
3. ANY EXPRESS WARRANTY NOT PROVIDED HEREIN, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH BUT FOR THIS PROVISION MIGHT ARISE BY IMPLICATION OR OPERATION OF LAW, IS HEREBY EXCLUDED AND DISCLAIMED. ALL IMPLIED WARRANTIES SUCH AS THOSE OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE, IF APPLICABLE, AS WELL AS ANY IMPLIED WARRANTIES WHICH MIGHT ARISE BY IMPLICATION OF LAW, ARE EXPRESSLY LIMITED TO A TERM OF ONE YEAR. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG A LIMITED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.
4. UNDER NO CIRCUMSTANCES SHALL RARITAN BE LIABLE TO PURCHASER OR ANY OTHER PERSONS FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES, WHETHER ARISING OUT OF BREACH OF WARRANTY, BREACH OF CONTRACT, OR OTHERWISE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.
5. No other person or entity is authorized to make any express warranty, promise or affirmation of fact or to assume any other liability on behalf of Raritan in connection with its products except as specifically set forth in this warranty.
6. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

RARITAN
The Most Dependable Name on the Water

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